



Welcome to this issue of

NATIONAL SECURITY SCIENCE

Los Alamos National Laboratory has been at the forefront of high-explosives research since the Manhattan Project in 1943. The science of high-explosive performance is central to stockpile stewardship.

Yet, explosives science at the Laboratory isn't simply about maintaining and certifying the aging U.S. nuclear deterrent; it's also about developing novel applications of that science to other national security challenges. In 2015,

Los Alamos executed more than 400 high-explosive-driven experiments (averaging more than one a day). The tests were conducted in support of a diverse number of projects, such as rocket propellant science. (See "Explosive Results," page 11.)

Understanding explosives is more than a scientific curiosity; this research has urgent and global impacts. The nation's Explosive Ordnance Disposal (EOD) experts—the men and women who have the dangerous responsibility to seek out and destroy hostile munitions, improvised explosive devices, and the laboratories that produce them—must also understand the science behind their job. Thus, every six weeks, Los Alamos offers an Advanced Homemade Explosives Course to educate EOD techs about the nature of the raw materials commonly found in explosives and how to safely defeat them. (See "The Hurt-Locker School," page 3.)

In 2016, the EOD courses will continue alongside a host of other vital projects and explosives-science research. The year is already off to an explosive start, as Lab scientists work to characterize the "hydrogen bomb" detonated on January 6 by North Korea. (See "Shake, Rattle, and Roll," page 20).

The Laboratory is also working with the Department of Energy to grant public access to several 1940s-era Laboratory facilities within the new Manhattan Project National Historical Park. The challenge is provide safe access without compromising the ongoing national security work at the Lab. (See "Manhattan Project National Historical Park," page 22.)

The Manhattan Project led to a surprising partnership between Los Alamos and an unlikely affiliate: the United States Navy. After the war, the Lab designed the first nuclear weapon to enter the Navy's stockpile, and Los Alamos designed every nuclear weapon the Navy currently deploys. Today, the relationship between the two remains as strong as ever. (See "Charting a Parallel Course," page 30.)

The Laboratory's nuclear weapons work remains vital to U.S. Strategic Command, which is led by U.S. Navy Admiral Cecil D. Haney. Los Alamos staff are among those who support the "chess players" that Admiral Haney says the nation needs to play "in a multi-dimensional environment" on a board "where they may not fully understand the rules by which our adversaries are playing." (See "Strategic Deterrent Forces," page 26.)

Making sense of this "board"—and being proactive about the findings—is why the Laboratory exists. Here's to another year of noteworthy accomplishments and continued excellence in 2016.

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